special case is a variant of Choquet's existence theorem for distributions of random closed sets in locally compact second countable Hausdorff spaces S. Our approach to this result shows that it holds as soon as the topology of S is continuous and second countable. We also obtain characterizations of the distributions of all random compact and all random compact convex subsets in R^d for finite d.

Some Properties of Westcott's Functional

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For random measures on locally compact spaces the so-called Laplace functional is the appropriate generalization of the classical Laplace transform. These functionals may be characterized by positive definiteness and a weak continuity property. A certain sharper version of positive definiteness will be shown to single out the Westcott's functionals, i.e. the Laplace functionals of joint processes. A stronger continuity requirement characterizes finitary point processes.

Subordination of Stationary Processes

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Let $X=\{X(t), t\in T\subset\mathbb{R}\}$ be a stationary process and suppose that $N=\{N(t), t\geqslant 0\}$ is an infinitely divisible process, independent of X. Then the process $\hat{X}:=\{\hat{X}(t)=X(N(t)), t\geqslant 0\}$ is called subordinated to X (or derived from X) with subordinator N. We show that $\hat{X}$ is again a stationary process and we relate the spectral properties of X and $\hat{X}$ by comparing their spectral measures. We obtain among others that if X is stochastically continuous

$$\hat{f}(x)=\frac{1}{\pi}\int_{-\infty}^{\infty}\frac{\operatorname{Re}\varphi(u)}{(\operatorname{Re}\varphi(u))^2+(x+\operatorname{Im}\varphi(u))^2}f(u)\,du,\quad -\infty<x<\infty.$$

Here f and $\hat{f}$ are the resp. spectra of X and $\hat{X}$ and $\varphi(u)=-\log E(e^{iuN(1)})$. We also discuss the possibility of a derived stationary process to model time series in random time domains and give several examples.

2.9. GSMPS's *and insensitivity*

Insensitivity with Interruptions

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The theory of insensitivity within Generalised Semi-Markov Schemes is extended to cover classes of models in which the generally distributed lifetimes can be terminated prematurely by the deaths of negative exponentially distributed lifetimes. As a consequence of this approach it is shown that there exists classes of processes